A Comparison of Problem Lists Generated by Physicians, Nurses, and Patients: Implications for CPR Systems

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Using a sample of 201 patients hospitalized for Pneumocystis carinii pneumonia, this study describes problem lists generated by physicians and examines the overlap among problem lists generated by physicians, nurses, and patients. The findings indicate that the majority of patients in this sample had at least one problem that occurred in more than one problem list. Problems that most frequently appeared in more than one problem list were those related to the medical diagnosis of Pneumocystis carinii pneumonia and its associated physiological symptoms. Problems which occurred uniquely in the nurse problem list were knowledge deficit and potential for injury. Thirty-four percent of the patients identified at least one psychosocial problem that did not occur in either the physician- or nurse-generated problem lists. The study findings demonstrate that while there is overlap among the problem lists in problems related to the principal medical diagnoses, the nurse- and patient-generated problem lists include unique problems which provide additional significant information related to patient status that has the potential to impact patient outcomes. These findings suggest that a unified, nonredundant, multidisciplinary problem list is warranted in order to provide a comprehensive view of the patient for computer-based patient record (CPR) systems. Appropriate data models and comprehensive controlled vocabularies are needed to support the multiple uses of the problem list for CPR systems.

INTRODUCTION

Problem-oriented patient records have existed for decades in both paper-based and computer-based formats.[1-3] The Institute of Medicine report on the computer-based patient record highlighted the role of maintaining a problem list that delineates the patient's clinical problems and the status of each problem for CPR systems.[4] In addition, Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards require that the patient record include the documentation of medical diagnoses, nursing diagnoses, and other patient care needs, as well as the therapeutic interventions provided.[5] However, physicians and nurses have traditionally maintained separate patient problem lists and the patient's role in the delineation of the problem list has been undefined.[3,6-7] More recently, multidisciplinary case management plans and critical paths have been developed to manage cost and quality outcomes for specific medical diagnoses or patient problems.[8-9] We have previously described the content of nurse- and patient-generated problem lists.[10-11] The purpose of this paper is to compare the content of problem lists generated by physicians, nurses, and patients and to discuss the implications of the findings for the design of CPR systems.

Problem Lists Generated by Physicians

Medical diagnosis and treatment are the major focus of the physician problem list. Some computer-based systems have forced the use of controlled vocabularies, while others allow the physicians to enter the problems using their own terminology.[12-14] Several studies have rated ICD 9 CM codes as inadequate for comprehensively representing the contents of the problem list and suggested that more clinically expressive controlled vocabularies such as SNOMED International are needed to adequately capture the problem list for CPR systems.[14-15]

Problem Lists Generated by Nurses

Traditionally, the nursing problem list has primarily appeared in the form of a nursing care plan.[6-7] The nurses progress note or flowsheet may also follow a problem-oriented format. In contrast to the physician problem list, the focus of the nursing list is the human response to actual or potential health problems/life processes and problems are most frequently described using nursing diagnoses, patient signs, and patient symptoms.[6,11,16-17] Research comparing the number and type of problems generated using paper-based and computer-based care planning systems for the delineation of the nursing problem list has been equivocal.[6-7,17]

Significance of Patient Perceptions

The significance of patient perceptions of health-related problems for health care practice, education, research, and policy has been identified by several authors.[18-19] Longo proposed a new model for examination of practice variation that includes "patient practice style variation." He stated that "studies of outcomes must take advantage of what is known about patient problem perception, problem status measurement (by contrast with health status measurement), patient satisfaction, sick role and illness behavior in a life style context, and characteristics and dimensions of disease as experienced through the eyes of patients."[19] In addition, a number of studies have documented the lack of agreement of patient and provider perceptions of problems, particularly in the areas of symptom identification, symptom ratings, and psychosocial problem identification.[20-23]

METHODS

Research Questions

Two research questions were addressed in this descriptive study: 1) What is the nature of problem lists generated by physicians? and 2) Does overlap exist among the problem lists generated by physicians, nurses, and patients?

Sample

This analysis was conducted as part of a larger study examining the quality of nursing care of 201 persons living with AIDS (PLWAs) (NR02215, W.L. Holzemer, PI). The patients were predominantly male (99%) and Caucasian (80%) with a mean age of 37.8 years.

Procedure

The physician problem list was obtained from the problem list and problem-oriented note in the patient record. Physician documentation was manual in all three settings. The nurse problem list was obtained from the nursing care plan and nursing progress note/flowsheet. The three institutions represented three different types of nursing care plan systems: 1) computer-based, 2) standardized, paper-based; and 3) handwritten. Patient problem lists were obtained from patient interviews in which each patient was asked to identify his or her three or four major problems at the time.

All problems were entered verbatim into a relational database. Each problem was categorized according to content and was also placed into one of the following categories based on the terminology used to describe the problem: 1) medical diagnosis, 2) nursing diagnosis, 3) sign/symptom, 4) patient goal, or 5) other.

The problem lists generated for each patient by the physician, nurse, and patient were examined for the presence of overlapping problems. The patient was identified as having an overlapping problem if at least one problem was common between two lists. The problems were conceptually matched, rather than matched on exact terms used. For example, the terms *Pneumocystis carinii* pneumonia, impaired gas exchange, and shortness of breath were identified as conceptual matches, even though the first term was stated as a medical diagnosis, the second term was stated as a nursing diagnosis, and the third term was reported as a patient symptom.

RESULTS

Nature of Physician Problem Lists

There were a total of 423 problems on the physician problem list other than *Pneumocystis carinii* pneumonia and AIDS which were admission criteria for the study. The number of problems ranged from 0-12 with a mean of 2.1. As shown in Table 1, the problems were reflective of comorbidities of AIDS or complications related to its treatments.

Table 1. Most Frequently Occurring Additional Problems on the Physician Problem List

Problem	N
Oral candidiasis	43
Kaposi's sarcoma	38
Cytomegalovirus	27
Mycobacterium avium intracelluare	20

Overlap Among Problem Lists

The data in Table 2 show that the majority of patients in this sample had at least one problem which appeared on more than one problem list. Most frequently these problems were related to the medical diagnosis of *Pneumocystis carinii* pneumonia and its associated physiological symptoms, for example, shortness of breath and fever. All, but two, problems on the physician problem lists were reported as medical diagnoses, signs, or symptoms.

Table 2. Percentage of Patients with Problems Appearing on More Than One Problem List

Problem Lists	%
Patient and physician	62.7
Patient and nurse	56.7
Physician and nurse	55.7

Problems which occurred uniquely in the nurse problem list were knowledge deficit and potential for injury (ie. unsteady gait, at risk for fall). Thirty-four percent of the patients identified at least one psychosocial problem that did not occur on either the physician- or nurse-generated problem lists. These included financial concerns as well as psychological symptoms such as fear, and concerns related to death and dying. The physician-generated problem lists contained psychosocial problems for only three patients, anxiety (n=1) and depression (n=2).

DISCUSSION

While some overlap exists, problem lists generated by physicians, nurses, and patients for this sample of patients differed in terms of content and in the terminology used to report the problem. The data analysis reported in this paper shows that the typical physician-gemerated problem list in this sample comprised AIDS comorbidities and physical signs and symptoms, and also that those problems were described in terms of medical diagnoses, signs, and symptoms.

As we have previously reported, the most frequently occurring problem areas identified for this sample of patients in the nursing care plans and progress notes were: 1) respiratory function, 2) body temperature, 3) knowledge deficit, 4) psychosocial, 5) nutritional status, 6) activity, and 7) elimination.[10] As with the physician-generated problem list, the majority of the problems are related to the diagnoses of AIDS and *Pneumocystis carinii* pneumonia, and not unexpectedly, the focus of the nursing problem list is primarily on the human responses to the diagnoses since human responses are the targets of independent nursing interventions.[24] The type of terminology used by the nurses to describe the patient problems was predominantly nursing diagnoses, signs, and symptoms.[10]

We have also previously reported that the patients in this sample frequently described their problems using the language of health care professionals (i.e. medical diagnoses, nursing diagnoses, signs, and symptoms).[11] However, in addition, they identify problems related to social context, particularly in the areas of finances, unemployment, and housing. The physician-generated problem lists in the current analysis included only three psychosocial problems. While some types of problems reported by patients may not be within the purview of physician intervention they have the potential to affect the patient's response to treatment and also long term cost and quality outcomes.

These analyses suggest that the problem list of a single health care discipline, or of the patient alone, is not adequate to provide the broad view of problem status required for longitudinal CPR systems. A unified, nonredundant problem list may best meet this need. Building blocks for this type of problem list are a conceptual data model and a comprehensive controlled medical vocabulary.

Gouveia et al. proposed a conceptual data model for patient-based medical records in which problems are identified as evolutionary concepts with the evolution of the problem recorded through its episodes.[12] Using this data model, multiple problem episodes can be created within a single patient-provider encounter. In addition to the traditional active versus inactive, problem status can also be conceptualized as modified, dropped, resolved, or grouped. The representation of relationships among problems is also a key feature of the model that holds promise for long term

maintenance of a unified, nonredundant problem list for CPR systems. Relationships such as secondary-to, caused-by, and associated-with, could be used to demonstrate the linkages among problems from single or multiple sources. For example, the patient-generated problem of shortness of breath and the nurse-generated problem of impaired gas exchange could be linked with the medical diagnosis of *Pneumocystis carinii* pneumonia. CPR users could view either the entire problem list or receive a tailored view.

In their position paper on standards needed to create an efficient computer-stored medical record, the Board of Directors of the American Medical Informatics Association recommended the use of ICD 9 CM and SNOMED III codes to represent diagnoses and symptoms.[25] In addition, a number of studies have examined the ability of existing standardized classification schemes to represent patient problems. Chute et al. conducted an empirical evaluation of concept capture for 675 surgical diagnoses using three medical nomenclatures, the UMLS Metathesaurus, ICD 9 CM, and SNOMED II.[26] SNOMED II consistently outperformed the other classification systems as a result of the atomic nature of its terms, however, none of the three systems captured more than 60% of the clinical terms. Henry et al. examined the feasibility of using SNOMED III, which includes NANDA nursing diagnose, for the representation of nursing concepts. Sixty-nine percent of the terms recorded by nurses were matched using one or more SNOMED III terms.[10] A recent comparison of four schemes for codification of problem lists found that physicians were more satisfied with the clinical concept representation provided by UMLS and SNOMED than with that of Read and ICD 9 CM.[15] The potential for SNOMED International to adequately represent patients' perceptions of health-related problems has also been demonstrated.[11]

A longitudinal CPR system is essential to the provision of cost-effective, quality health care. This study suggests the potential utility of a problem list representing a variety of perspectives as an attribute of such a system. However, additional studies are needed which examine the contribution of each od the perspectives to the selection of appropriate management strategies and to the prediction of health-related outcomes.

A number of studies have demonstrated the adequacy of existing classification schemes, in particular, SNOMED International, to represent the problems on existing problem lists. However, additional research is needed to establish the appropriate data models to support problem lists in longitudinal CPR systems.

Acknowledgments

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